



NOAA DIVING PROGRAM

FY2000 ANNUAL REPORT



OVERVIEW

As the nation's ocean science agency, NOAA has a variety of programs that require research below the ocean's surface. NOAA scientists, engineers, and technicians who are trained and certified to dive by the NOAA Diving Program (NDP) conduct a multitude of underwater activities. The NDP, under the auspices of the Office of Marine and Aviation Operations (OMAO), is responsible for overseeing and managing NOAA diving personnel, equipment, and activities.

During FY2000, the NOAA Diving Program continued its excellent record of supporting NOAA programs in a safe, efficient, and economical manner. Three hundred forty six (346) NOAA divers spent over **7,395 hours** underwater during **11,882 dives** conducting a vast multitude of missions in waters worldwide under a variety of conditions. Conducting these operations were divers from the National Marine Fisheries Service, National Ocean Service, National Weather Service, Office of Oceanic and Atmospheric Research, and the Office of Marine and Aviation Operations. Diving activities ranged in location from the chilly coastal waters of Alaska to the tropical waters of the Caribbean, and from polluted coastal and inland waters to pristine open ocean. Ship's divers cleared screws, scrubbed transducers, cleaned sea chests, investigated navigational hazards, and supported a variety of scientific missions. Program divers conducted fish and habitat surveys, performed coral damage assessments, installed and maintained vital instrumentation, and sampled, observed, or counted an extensive variety of marine life. The NOAA Dive Center (NDC) trained and outfitted 122 individuals as Working Divers, Divemasters, EMT's, or Hyperbaric Physicians. Additional courses were taught in CPR, First Aid, mixed gas diving, and visual cylinder inspection. Unit Diving Supervisors and NDC certified an additional 29 persons nationwide as Scientific Divers.

SAFETY

The NOAA Diving Program continued its excellent safety record during the previous year with only 2 reported cases of undeserved decompression sickness (99.98% safe dive statistic). Only one case was duty related and occurred during dive training at the NOAA Diving Center in Seattle, WA. The second case occurred during a non-duty dive by a NOAA diver. Both cases of decompression sickness were resolved by treatment in a recompression chamber.

LINE OFFICE DIVING ACTIVITIES FY2000

NATIONAL OCEAN SERVICE (NOS)

The mission of the National Ocean Service is to be the nation's principal advocate for coastal and ocean stewardship and to support and provide the science, information, management, and leadership necessary to balance the environmental and economic well-being of the nation's coastal resources and communities. NOS divers work toward this common goal through assessment, documentation, restoration, and sustenance of underwater resources. One hundred thirty one (131) NOS divers conducted 4,342 dives for over 2,797 hours of bottom time in FY2000.

Divers from the Office of Ocean and Coastal Resource Management (OCRM) support NOAA's thirteen National Marine Sanctuaries. Sanctuary divers conducted diving operations in support of research, monitoring, resource management and educational outreach. Sanctuary divers routinely work with university scientists and federal, state, and local government agencies to accomplish their mission. During FY2000, tasks involved specimen identification and collection, reef damage assessment and restoration, photographic surveys, benthic resource characterizations, archeological surveys, equipment installation, monitoring and maintenance, and law enforcement. Diving operations also included submersible dives associated with the Sustainable Seas Expedition in the "Deepworker" submersible.



Stellwagen Bank National Marine Sanctuary
(photo by SBNMS dive team)

The center for Operational Oceanographic Products and Services (CO-OPS) utilizes divers in the engineering, installation,



Coral spawning at Flower Gardens Bank

maintenance, and repair of remote tidal measurement sensing devices and stations. During FY2000, CO-OPS divers worked throughout the world under arduous conditions installing, servicing, and

maintaining a global system of water-level stations (National Water Level Observation Network and National Tidal Datum), ADCP sensors and cabling for the Physical Oceanographic Real Time System, and tide gauges.

Divers from the Hydrographic Survey Division and Navigation Services Division conducted dives in conjunction with the acquisition and processing of precisely located geographic surveys to determine the configuration, locations, and identification of wrecks and obstructions. A majority of these dives were performed in low visibility and in areas of high current and marine traffic. The information gathered is critically important to the production of nautical charts while also benefiting the fishing industry and coastal zone managers.

OFFICE OF OCEANIC AND ATMOSPHERIC RESEARCH (OAR)

NOAA diver/scientists within OAR laboratories are responsible for developing, deploying, and maintaining a wide variety of scientific instruments in deep sea and coastal environments. Nine (9) OAR divers conducted 241 dives for 134 hours of bottom time in FY2000.

OAR divers at the Atlantic Oceanographic Meteorological Laboratory (AOML) dove in support of several long-term dredge disposal investigation projects for NOAA, the USEPA, and the Army Corps of Engineers. Activities included the design, installation, and maintenance of ADCP and water quality monitoring instruments at several sites off eastern coastal Florida. These sites provide real time data to state and federal dredge material disposal monitors. Additional sediment sampling was conducted in the vicinity of Fort Pierce, FL. AOML diver/scientists were responsible for the data collection and analysis of Florida Bay current information, which is critical to understanding and restoring the health of the local ecosystem.

Divers at the Pacific Marine Environmental Laboratory (PMEL) conducted field testing of various underwater mount-

ings, moorings, acoustic releases, sensors, CTD systems, and various types of sampling equipment and profilers as required by PMEL scientists and engineers. Conclusive field testing/evaluation of a bottom Extensometer and the New Millennium Observatory (NeMO-Net) camera system were conducted. Both systems have been successfully deployed along the Juan De Fuca Ridge and are integral components of the real-time Tsunami warning system and the NeMO-Net located at an active hydrothermal vent in vicinity of the Axial submarine volcano.

NATIONAL MARINE FISHERIES SERVICE (NMFS)

As steward of the nation's living marine resources, NMFS is responsible for conserving and promoting the health of the environment through science based management. In support of this mission, NMFS researchers routinely work underwater to collect data, conduct surveys, make observations, install and recover instrumentation, and evaluate fishing gear performance to accomplish agency, regional, center, and laboratory goals. One hundred eighteen (118) NMFS divers conducted 5,184 dives for over 3,200 hours of bottom time in FY2000.



Shrimp Trawl Turtle Excluder Device

Divers from the NMFS southeast region conducted environmental assessments, habitat restoration projects, and monitored resource changes resulting from habitat loss. Biological surveys of reef resources were conducted from Rhode Island down through the Florida Keys. Research divers made significant advancements in fishing gear evaluation techniques, shrimp trawl turtle excluder device design, and bycatch reduction device design. Habitat restoration projects began off of Key West, FL, Puerto Rico, and American Samoa.

FY2000 NOAA LINE OFFICE DIVING ACTIVITY

	No. Divers	No. Dives	Bottom Time
NMFS	118	5184	3222 hrs
NOS	131	4342	2797
OAR	9	241	134
OMAO	88	2115	1242
TOTALS	346	11882	7395

NMFS diving units in the northeast region continued ongoing environmental studies including habitat assessments, population restoration projects, and an underwater shark study in the Florida Keys and Bahamas.

In the Northwest, NMFS divers were involved in fish and invertebrate surveys and sample col-

lection, benthic sampling, fishing gear development, operational assessments, and critical facility maintenance. Divers studied methods to deter California sea lions from preying on threatened and endangered salmon species, surveyed Atka mackerel spawning grounds as part of a life history study, and conducted Tanner and Red crab population studies.



Entangled Hawaiian Monk Seal

NMFS divers in the southwest region assessed community changes in the waters off northern and southern California and Hawaii. They monitored and assisted in habitat restoration projects and assessed biological and geological conditions to ensure regulation compliance. Evaluations and inspections of water

diversion intake screens and associated structures were performed to determine their efficacy in fish protection. Side-by-side field evaluations of open and closed circuit scuba for use in deep-water diving were also conducted.

OFFICE OF MARINE AND AVIATION OPERATIONS (OMAO)

SHIPS

OMAO divers are assigned aboard NOAA's fleet of oceanographic, fisheries research, and hydrographic survey vessels to provide the ship and scientists with a cost-effective, professional, and responsive resource. The underwater tasks performed by OMAO divers support both the operation of vessels (ship husbandry and maintenance and repair of underwater systems) and the collection of scientific data (sample collection, and scientific equipment installation, removal, and maintenance). OMAO divers are an integral support element essential to shipboard research missions. Diving complements not only support the scientific parties through the completion of dives, but assist in the planning and conduct of proposed activities to maximize safety and efficiency. Dives are often made under arduous conditions in low visibility, high current, around floating ice, and within congested harbors and shipping lanes. Eighty eight (88) OMAO divers conducted 2,115 dives for 1,242 hours of bottom time in FY2000.

Hydrographic survey vessel divers from NOAA Ships RAIN-



Ship's Diver conducting hull inspection

IER, WHITING and RUDE conducted item investigations to verify the depth and position of potential hazards to marine navigation. Identified hazards are later placed on NOAA's suite of nautical charts. Diving operations also supported hydrographic data acquisition through the installation and maintenance of tide gauge instrumentation.

Divers from the NOAA Ships McARTHUR, FERREL, GORDON GUNTER, and KA'IMIMOANA dove in support of the National Marine Sanctuary Programs (NMSP) at Gray's Reef, Florida Keys, Hawaiian Islands, Channel Islands, and Monterey Bay as well as the West Florida Shelf. Diving operations consisted of deploying/recovering scientific equipment, biological and geological surveying/sampling, submersible support, underwater photography and educational outreach. FY2000 marked the second year of NOS's NMSP participation in the Sustainable Seas Expeditions.

Divers aboard NOAA's fisheries research vessels dove in support of various NMFS investigations. Activities included the establishment of a seagrass-monitoring site near Cape Sable, Florida as well as widespread biological surveys, specimen collection and counts, underwater habitat assessment, and critical facilities maintenance. Divers aboard the NOAA Ship KA'IMIMOANA supported OAR's Tropical Atmosphere Ocean deep-sea oceanographic studies through the deployment, maintenance, and recovery of sub-surface oceanographic equipment.

NOAA DIVING CENTER (NDC)

The majority of NOAA dive training is conducted at the NDC training facility in Seattle, Washington. Dive training programs range from basic to specialized instruction in the use of snorkel, open circuit scuba, surface supplied, polluted water, mixed gas, and recompression chamber operation. Additional courses include Emergency Medical Technician, Diving Medical Technician, First Aid, CPR, Visual Cylinder Inspection, and a NOAA/Underwater & Hyperbaric Medical Society (UHMS) Physician's Course.

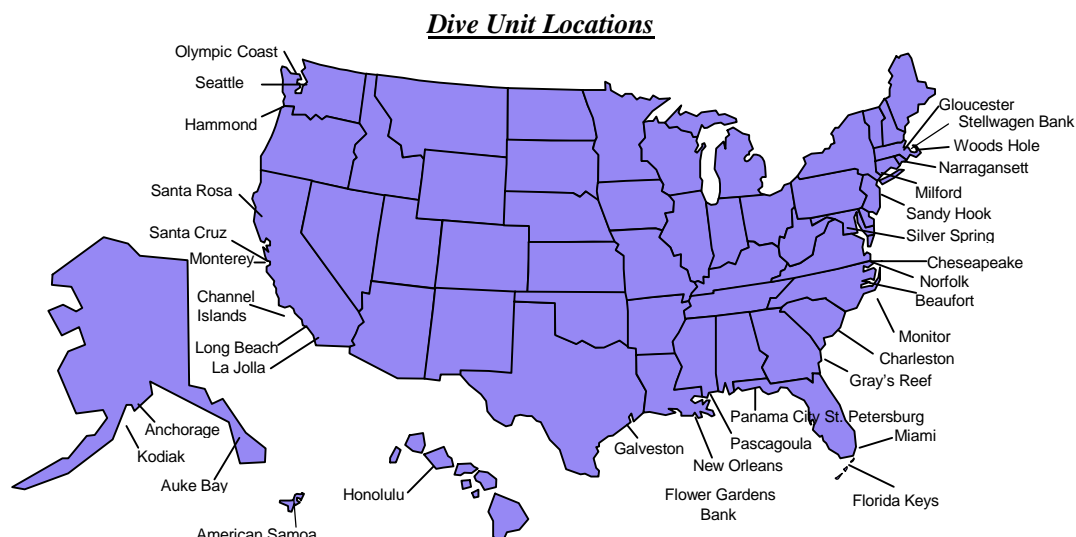


Diver Trainees in Seattle, WA

In addition to NOAA employees, students attending NDC training programs include representatives from numerous other government agencies. Contract, other federal, state and municipal attendees are enrolled on a space available basis. Outside agency participation in FY2000 included:

<i>Renton (WA) Fire Department</i>	<i>United States Coast Guard</i>
<i>Seattle (WA) Fire Department</i>	<i>United States Secret Service</i>
<i>Seattle (WA) Police Harbor Patrol</i>	<i>University of Washington</i>
<i>Environmental Protection Agency</i>	<i>Washington State Ferries</i>
<i>King County (WA) Sheriff's Department</i>	
<i>Snohomish County (WA) Sheriff's Department</i>	
<i>Florida Department of Environmental Protection</i>	

During the fiscal year, personnel from the NOAA Diving Center supported activities of the NOAA Line Offices, state/local government agencies, educational institutions, community groups and the general public. These outreach efforts consisted of technical guidance, operational support, and educational services that aided the requesting organization(s) and heightened visibility of NOAA and the NOAA Diving Program. The following activities were accomplished during the FY2000:



Technical Guidance and Assistance

- Edited the 4th edition of the NOAA Diving Manual for technical content and authored several sections.
- Inspected equipment involved in diving fatalities for two law enforcement agencies.
- Evaluated and demonstrated Harris Acoustic's diver held sonar system.
- Hosted NAUI (National Association of Underwater Instructors) Northwest Conference at NOAA WASC.
- Developed new, abbreviated air and nitrox decompression tables for inclusion in the new NOAA Diving Manual.

- Presented talk on Monitor Expedition at AAUS Technical Diving Workshop.
- Instructed Virginia Mason Medical Center Technicians on decompression.

NDC - SEP

FY2000 marked the 11th year of the NOAA Diving Program's Standardized Equipment Program (SEP). The SEP was introduced by NDP to enhance the safety of NOAA diving operations through standardization of dive equipment, maintenance, and quality control. Diving equipment is purchased, issued, and critical maintenance performed by the NOAA Diving Center. All active NOAA divers are eligible for this program.

Operational Support

- Provided divers for ship husbandry services for NOAA's MILLER FREEMAN and FAIRWEATHER.
- Provided mixed breathing gas training to law enforcement and search and rescue units.
- Provided stand-by recompression chamber for Virginia Mason Medical Center in Seattle, WA.
- Implemented Emergency Oxygen Elder Valve test program
- Took possession and began refurbishment of 54" diameter double lock recompression chamber for use in support of future NOAA operations.



Salvage of the ASHAME by diver trainees

Since SEP's inception, diver safety has improved significantly through equipment uniformity and quality in-house maintenance and testing. Another benefit of the SEP is that centralized bulk equipment purchasing reduces the costs a NOAA unit would pay for comparable equipment by approximately 50%. During FY2000 the SEP program fully outfitted over 65 new and returning divers, performed annual maintenance on over 270 regulators, and generally supported all divers with equipment replacement and maintenance.

Educational Services

- Provided First Aid and CPR training for non-diving NOAA employees in Seattle, WA.
- Conducted tours of the facility to personnel from the USGS, other NOAA offices, United States Coast Guard, and faculty and students from local academic institutions.

ACKNOWLEDGEMENTS

The information represented in this report reflects the efforts of many dedicated NOAA employees who use diving as a tool to help them accomplish vital research projects. It is through these efforts that the NOAA Diving Program continues as one of the most active and respected diving programs in the United States.